THE ASTROPHYSICAL JOURNAL

CONTENTS OF VOLUME 355, PART 1

1990 MAY 20, Number 1

		Page	Fiche
COSMOLOGICAL OBSERVATIONS IN AN INHOMOGENEOUS UNIVERSE	*Kazuya Watanabe and Kenji Tomita*	1	87-A12
APPARENT SPATIAL UNIFORMITY OF THE GAMMA-RAY BURSTS DETECTED BY THE KONUS EXPERIMENT ON *VENERA 11* AND *VENERA 12*	*J. C. Higdon and Maarten Schmidt*	13	87-B11
ON THE ORIGIN OF LITHIUM	*Hubert Reeves, Jacques Richer, Katsuhiko Sato, and Nobuo Terasawa*	18	87-C3
THE HALO AND MAGNETIC FIELD OF THE COMA CLUSTER OF GALAXIES	*K.-T. Kim, P. P. Kronberg, P. E. Dewdney, and T. L. Landecker*	29	87-D1
SELF-COLLIMATED ELECTROMAGNETIC JETS FROM MAGNETIZED ACCRETION DISKS: THE EVEN-SYMMETRY CASE	*J. C. L. Wang, M. E. Sulkanen, and R. V. E. Lovelace*	38	87-D12
DARM MATTER IN SPIRAL GALAXIES	*Massimo Persic and Paolo Salucci*	44	87-E5
OPTICAL TRACERS OF SPIRAL WAVE RESONANCES IN GALAXIES: APPLICATIONS TO NGC 1566	*Bruce G. Elmegreen and Debra Meloy Elmegreen*	52	87-F1
THE KINEMATICS AND MORPHOLOGY OF NGC 520	*S. A. Stanford and M. Balcells*	59	87-F10
IMAGING SPECTROPHOTOMETRY OF IONIZED GAS IN NGC 1068. I. KINEMATICS OF THE NARROW-LINE REGION	*Gerald Cecil, Jonathan Bland, and R. Brent Tully*	70	87-G10
Paβ MEASUREMENTS AND REDDENING IN SEYFERT 1.8 AND 1.9 GALAXIES	*Robert W. Goodrich*	88	88-B1
SUBMILLIMETER CONTINUUM EMISSION FROM GALAXIES: STAR FORMATION AND THE INTERSTELLAR MEDIUM IN THE LOCAL GROUP DWARF IC 10	*Harley A. Thronson, Jr., Deidre A. Hunter, Sean Casey, and D. A. Harper*	94	88-B9
A MEASUREMENT OF THE TEMPERATURE OF THE COSMIC MICROWAVE BACKGROUND AT A FREQUENCY OF 7.5 GHz	*A. Kogut, M. Bensadoun, G. De Amici, S. Levin, G. F. Smoot, and C. Witebsky*	102	88-C6
ULTRAVIOLET INTERSTELLAR ABSORPTION TOWARD HD 163522, A STAR AT 9 KILOPARSECS IN THE DIRECTION $l = 350°$ AND $b = -9°$	*Blair D. Savage, Derck Massa, and Kenneth Sembach*	114	88-D5
INTERSTELLAR ABSORPTION ALONG THE LINE OF SIGHT TO σ SCORPII USING *COPERNICUS* OBSERVATIONS	*M. M. Allen, T. P. Snow, and E. B. Jenkins*	130	88-E9
Mg II OBSERVED IN THE LOCAL INTERSTELLAR MEDIUM: THE LOCAL CLOUD	*R. Génova, P. Molaro, G. Vladilo, and J. E. Beckman*	150	88-G2
AN NH_3 RING AROUND THE INFRARED SOURCES IN NGC 2071	*Shudong Zhou, Neal J. Evans II, and Lee G. Mundy*	159	88-G12
POLARIZATION OF THE $\lambda = 1.3$ MILLIMETER CONTINUUM RADIATION FROM THE KLEINMANN-LOW NEBULA	*G. Novak, C. R. Predmore, and P. F. Goldsmith*	166	89-A7
COLLAPSE AND FRAGMENTATION OF ISOTHERMAL AND POLYTROPIC CYLINDRICAL CLOUDS	*François Rouleau and Pierre Bastien*	172	89-B1
SPECTROSCOPY OF EXTENDED RED EMISSION IN REFLECTION NEBULAE	*Adolf N. Witt and Todd A. Boroson*	182	89-B12
RADIATIVE TRANSFER MODELING OF RADIO-FREQUENCY SPECTRAL LINE DATA: ACCRETION ONTO G10.6−0.4	*E. R. Keto*	190	89-C7
SHOCKED [O I] 63 MICRON LINE EMISSION FROM THE SUPERNOVA REMNANT IC 443	*Michael G. Burton, D. J. Hollenbach, M. R. Haas, and E. F. Erickson*	197	89-D1
STABILITY OF A COLLAPSED STAR IN BIMETRIC GENERAL RELATIVITY	*Amos Harpaz and Nathan Rosen*	210	89-E1

CONTENTS

		Page	Fiche
ON THE STABILITY PROPERTIES OF WHITE DWARF RADIATIVE SHOCKS: SETTLING SOLUTIONS	*James N. Imamura and Michael T. Wolff*	216	89-E9
THE OSCILLATIONS OF RAPIDLY ROTATING NEWTONIAN STELLAR MODELS	*James R. Ipser and Lee Lindblom*	226	89-F7
RAPIDLY ROTATING PULSARS AND THE EQUATION OF STATE	*James M. Lattimer, Madappa Prakash, Dieter Masak, and Amos Yahil*	241	89-G10
NON-LTE MODEL CALCULATIONS FOR SN 1987A AND THE EXTRAGALACTIC DISTANCE SCALE	*W. Schmutz, D. C. Abbott, R. S. Russell, W.-R. Hamann, and U. Wessolowski*	255	90-A12
AN EXPLANATION OF LIGHT-CURVE ASYMMETRIES IN CONTACT BINARIES BY MEANS OF THE CORIOLIS EFFECT	*Dao-Qi Zhou and Kam-Ching Leung*	271	90-C1
THEORETICAL LIGHT CURVE FOR THE RECURRENT NOVA U SCORPII	*Mariko Kato*	277	90-C9
HEATING AND MELTING OF SMALL ICY SATELLITES BY THE DECAY OF ^{26}Al	*Dina Prialnik and Akiva Bar-Nun*	281	90-D1
PROTON ENERGY SPECTRA AT THE SUN IN THE SOLAR COSMIC-RAY EVENTS ON 1978 MAY 7 and 1984 FEBRUARY 16	*J. A. Lockwood, H. Debrunner, E. O. Flückiger, and H. Grädel*	287	90-D8
LOWER SOLAR CHROMOSPHERE-CORONA TRANSITION REGION. I. THEORETICAL MODELS WITH SMALL TEMPERATURE GRADIENTS	*D. Tod Woods, Thomas E. Holzer, and Keith B. MacGregor*	295	90-E4
LOWER SOLAR CHROMOSPHERE-CORONA TRANSITION REGION. III. IMPLICATIONS OF THE OBSERVED QUIET-SUN EMISSION MEASURE INCLUDING WAVE PRESSURE EFFECTS	*D. Tod Woods, Thomas E. Holzer, and Keith B. MacGregor*	309	90-F6
MICROWAVE STRUCTURE OF THE QUIET SUN AT 8.5 GHz	*Dale E. Gary, Harold Zirin, and Haimin Wang*	321	90-G6
HIGH-RESOLUTION SPECTRA OF SOLAR MAGNETIC FEATURES. I. ANALYSIS OF PENUMBRAL FINE STRUCTURE	*B. W. Lites, G. B. Scharmer, and A. Skumanich*	329	91-A1
THE EFFECT OF NONEQUILIBRIUM IONIZATION ON ULTRAVIOLET LINE SHIFTS IN THE SOLAR TRANSITION REGION	*D. Spadaro, G. Noci, R. A. Zappalà, and S. K. Antiochos*	342	91-B5
^{88}Sr AND ^{89}Y: THE *s*-PROCESS AT MAGIC NEUTRON NUMBER $N = 50$	*F. Käppeler, W. R. Zhao, H. Beer, and U. Ratzel*	348	91-B12
THE PHYSICAL AND INFRARED SPECTRAL PROPERTIES OF CO_2 IN ASTROPHYSICAL ICE ANALOGS	*S. A. Sandford and L. J. Allamandola*	357	91-C9
ABSTRACTS OF THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 1990 JUNE			
Optical Properties of Impulsive Flares	*Harold Zirin and Frances Tang*	373	91-D13
Soft X-Ray Spectroscopy of Solar Flares: An Overview	*G. A. Doschek*	374	91-D14
Observational Clues to the Energy Release Process in Impulsive Solar Bursts	*David Batchelor*	374	91-D14
High-Velocity Evaporation During the Impulsive Phase of the 1984 April 24 Flare	*E. Antonucci, M. A. Dodero, and R. Martin*	374	91-D14
Velocity-Temperature Distribution in the Evaporating Plasma during the Impulsive Phase of Solar Flares	*E. Antonucci, M. A. Dodero, and R. Martin*	375	91-E1
Nonpotential Magnetic Fields at Sites of Gamma-Ray Flares	*M. J. Hagyard, P. Venkatakrishnan, and J. B. Smith, Jr*	376	91-E2
Meter-Decimeter and Microwave Radio Observations of Solar Flares	*M. Pick, K.-L. Klein, and G. Trottet*	376	91-E2
A High-Speed Shock Wave in the Impulsive Phase of the 1984 April 24 Flare	*H. Nakajima, S. Kawashima, N. Shinohara, Y. Shiomi, S. Enome, and E. Rieger*	376	91-E2
Rise Times in Solar Radio Bursts	*J. E. R. Costa and E. Correia*	377	91-E3
On Removal of the Gradual Component in Analyses of Solar Impulsive Bursts	*J. E. R. Costa, J. C. Brown, E. Correia, and P. Kaufmann*	377	91-E3
Ion and Relativistic Electron Transport in Solar Flares	*R. Ramaty, J. A. Miller, X.-M. Hua, and R. E. Lingenfelter*	377	91-E3
Neutrons and Gamma-Ray Emission on 1982 June 3: The Possibility of Fitting the Data on the Assumption of One Population of Accelerated Particles	*V. G. Gugleko, Yu. E. Efimov, G. E. Kocharov, G. A. Kovaltsov, N. Z. Mandzhavidze, M. M. Terekhov, and L. G. Kocharov*	378	91-E4
Emission Characteristics of Three Intense Solar Flares Observed in Cycle 21	*Edward L. Chupp*	378	91-E4
Observations of Solar Flare Gamma-Ray Spectra with the *Hinotori* Satellite	*M. Yoshimori*	379	91-E5
Energetic Particles from Impulsive Solar Flares	*Donald V. Reames*	379	91-E5
The Relationship between Energetic Particles and Flare Properties for Impulsive Solar Flares	*H. V. Cane and D. V. Reames*	379	91-E5
Signature of the Solar Cosmic-Ray Event on 1982 June 3	*H. Debrunner, E. O. Flückiger, and J. A. Lockwood*	379	91-E5

CONTENTS

	Page	Fiche
SPECTRA OF RELATIVISTIC SOLAR PROTON GROUND-LEVEL EVENTS RECORDED AT SANAE, ANTARCTICA — *P. H. Stoker and S. Makgamathe*	380	91-E6
WERE SOLAR NEUTRONS OBSERVED BY NEUTRON MONITORS ON 1984 APRIL 25? — *D. F. Smart, M. A. Shea, E. O. Flückiger, H. Debrunner, and J. E. Humble*	380	91-E6
SOLAR NEUTRON DECAY PROTON OBSERVATIONS IN CYCLE 21 ..... *Paul Evenson, Richard Kroeger, Peter Meyer, and Donald Reames*	381	91-E7
A 153 DAY PERIODICITY IN THE OCCURRENCE OF SOLAR FLARES PRODUCING ENERGETIC INTERPLANETARY ELECTRONS — *Wolfgang Dröge, Kenneth Gibbs, John M. Grunsfeld, Peter Meyer, Brian J. Newport, Paul Evenson, and Dan Moses*	381	91-E7
SOLAR ENERGETIC PARTICLE OBSERVATIONS OF THE 1982 JUNE 3 AND 1980 JUNE 21 GAMMA-RAY/NEUTRON EVENTS — *M. A. I. Van Hollebeke, F. B. McDonald, and J. P. Meyer*	382	91-E8
A SEARCH FOR SOLAR NEUTRON RESPONSE IN NEUTRON MONITOR DATA ..... *K. Kudela*	382	91-E8
IMPACT LINE LINEAR POLARIZATION AS A DIAGNOSTIC OF 100 keV PROTON ACCELERATION IN SOLAR FLARES — *J. C. Hénoux, G. Chambe, D. Smith, D. Tamres, N. Feautrier, M. Rovira, and S. Sahal-Bréchot*	383	91-E9
PROMPT ION ACCELERATION TO RELATIVISTIC ENERGIES BY A LARGE-AMPLITUDE MAGNETOSONIC WAVE ..... *Yukiharu Ohsawa*	384	91-E10
PROMPT PARTICLE ACCELERATION AND PLASMA JET FORMATION DURING CURRENT LOOP COALESCENCE IN SOLAR FLARES — *Jun-ichi Sakai*	385	91-E11
NEUTRAL BEAMS IN TWO-RIBBON FLARES AND IN THE GEOMAGNETIC TAIL ..... *P. C. H. Martens and A. Young*	385	91-E11
BEAM HEATING IN SOLAR FLARES: ELECTRONS OR PROTONS? — *J. C. Brown, M. Karlicky, A. L. MacKinnon, and G. H. J. van den Oord*	386	91-E12
SOLAR FLARE γ-RAY LINE SHAPES ..... *C. Werntz, F. L. Lang, and Y. E. Kim*	386	91-E12

1990 JUNE 1, Number 2

THE MASS FUNCTION OF GALAXY CLUSTERS ..... *Yin Zhan*	387	93-C1
A REDSHIFT SURVEY TOWARD A PROPOSED VOID OF GALAXIES SUGGESTED BY THE DISTRIBUTION OF ABELL CLUSTERS ..... *Jeffrey A. Willick, Jean P. Brodie, and Stuart Bowyer*	393	93-C8
SEARCH FOR COLD GAS IN CLUSTERS WITH AND WITHOUT COOLING FLOWS..... *D. A. Grabelsky and M. P. Ulmer*	401	93-D4
A GLOBULAR CLUSTER SYSTEM SURROUNDING THE cD GALAXY NGC 6166..... *C. J. Pritchet and William E. Harris*	410	93-E1
A MODEL TO EXPLAIN THE CORRELATION BETWEEN THE OPTICAL AND RADIO PROPERTIES OF HIGH-REDSHIFT GALAXIES ..... *R. A. Daly*	416	93-E8
FLOW PATTERNS IN RADIO HOT SPOTS: A STUDY OF 3C 33 NORTH ..... *Lawrence Rudnick and Martha Anderson*	427	93-F7
NUCLEAR CONCENTRATION OF MOLECULAR GAS IN THE LATE-TYPE SPIRAL GALAXY NGC 6946: 300 PARSEC SCALE GASEOUS DISK....*S. Ishizuki, R. Kawabe, M. Ishiguro, S. K. Okumura, K.-I. Morita, Y. Chikada, T. Kasuga, and M. Doi*	436	93-G3
NUCLEAR OUTLFOW FROM THE EDGE-ON GALAXY NGC 3628..... *G. Fabbiano, T. Heckman, and W. C. Keel*	442	93-G11
LATE-TYPE STARS IN AN INNER AND FAR DISK FIELD OF M31 — *Harvey B. Richer, Dennis R. Crabtree, and Christopher J. Pritchet*	448	94-A5
SPECTROPOLARIMETRY OF HIGH-POLARIZATION SEYFERT 2 GALAXIES AND UNIFIED SEYFERT THEORIES — *J. S. Miller and R. W. Goodrich*	456	94-B1
OBSERVATIONS OF GALACTIC AND EXTRAGALACTIC HIGH-ENERGY X-RAY SOURCES — *G. Matt, E. Costa, D. Dal Fiume, W. Dusi, F. Frontera, and E. Morelli*	468	94-C1
STRUCTURE OF THE INTERSTELLAR MEDIUM IN THE MAGELLANIC CLOUDS ..... *S. R. Wayte*	473	94-C7
THE LOW-MASS X-RAY BINARY LMC X-2 — *David Crampton, A. P. Cowley, J. B. Hutchings, Paul C. Schmidtke, and I. B. Thompson*	496	94-F1
RADIATIVE MAGNETIZED THERMAL CONDUCTION FRONTS — *Kazimierz J. Borkowski, Steven A. Balbus, and Carl C. Fristrom*	501	94-F7
THE EFFECT OF CATASTROPHIC COLLISIONAL FRAGMENTATION AND DIFFUSE MEDIUM ACCRETION ON A COMPUTATIONAL INTERSTELLAR DUST SYSTEM..... *Kurt Liffman*	518	94-G12

		Page	Fiche
ANALYSIS OF ^{12}CO AND ^{13}CO EMISSION IN A 3 SQUARE DEGREE REGION OF THE GALACTIC PLANE BETWEEN $l = 23°$ AND $25°$	*Youngung Lee, Ronald L. Snell, and Robert L. Dickman*	536	95-B4
INTERSTELLAR CYANOMETHANE	*B. E. Turner, P. Friberg, W. M. Irvine, S. Saito, and S. Yamamoto*	546	95-C4
NEW H_2O MASERS IN THE NGC 7538 REGION	*Osamu Kameya, Koh-Ichiro Morita, Ryohei Kawabe, and Masato Ishiguro*	562	95-D7
MORPHOLOGIES OF PLANETARY NEBULAE EJECTED BY CLOSE-BINARY NUCLEI	*Howard E. Bond and Mario Livio*	568	95-E1
AN INTERPRETATION OF X-RAY SPECTRA OF TYPE II BURSTS FROM THE "RAPID BURSTER": COMPTONIZATION DUE TO ACCRETION FLOW	*Kouichi Hirotani, Tomoyuki Hanawa, and Nobuyuki Kawai*	577	95-F11
A MODEL FOR THE HIGH-ENERGY POWER-LAW COMPONENT OBSERVED IN THE X-RAY SPECTRA OF LOW-MASS X-RAY BINARIES	*Tomoyuki Hanawa*	585	95-G6
RESONANCES AND PERIOD DOUBLING IN THE PULSATIONS OF STELLAR MODELS	*Pawel Moskalik and J. Robert Buchler*	590	95-G12
THE CONVECTIVE URCA MECHANISM	*Zalman Barkat and J. Craig Wheeler*	602	96-A12
LB 1800: A BRIGHT ECLIPSING CATACLYSMIC VARIABLE AND A TRANSIENT X-RAY SOURCE	*D. A. H. Buckley, D. J. Sullivan, R. A. Remillard, I. R. Tuohy, and M. Clark*	617	96-C1
THE PULSE-PHASE DEPENDENCE OF THE SPECTRUM OF GX 301−2	*D. A. Leahy and M. Matsuoka*	627	96-D1
DETECTION OF A 45 AU RADIUS SOURCE AROUND L1551-IRS 5: A POSSIBLE ACCRETION DISK	*Jocelyn Keene and Colin R. Masson*	635	96-D12
OBSERVATION OF THE CRAB PULSAR, PSR 0531+21, AT 0.2–6.0 MeV WITH THE FIGARO II EXPERIMENT	*B. Agrinier, J. L. Masnou, B. Parlier, M. Niel, P. Mandrou, G. Vedrenne, G. Gerardi, T. Mineo, B. Sacco, L. Scarsi, E. Costa, E. Massaro, G. Matt, M. Salvati, and A. G. Lyne*	645	96-E10
THE FORMATION PHASE OF THE SOLAR NEBULA	*Peter Bodenheimer, Harold W. Yorke, Michał Rózyczka, and Joel E. Tohline*	651	96-F4
MONODEUTERATED METHANE IN THE OUTER SOLAR SYSTEM. IV. ITS DETECTION AND ABUNDANCE ON NEPTUNE	*C. de Bergh, B. L. Lutz, T. Owen, and J.-P. Maillard*	661	96-G1
PLANETARY PERTURBATIONS AND THE ORIGIN OF SHORT-PERIOD COMETS	*Thomas Quinn, Scott Tremaine, and Martin Duncan*	667	96-G9
DUST IN COMETS. I. THERMAL PROPERTIES OF HOMOGENEOUS AND HETEROGENEOUS GRAINS	*David J. Lien*	680	97-A10
TURBULENT THERMAL CONDUCTION IN THE SOLAR TRANSITION REGION	*P. S. Cally*	693	97-B10
ENERGY BALANCE IN THE SOLAR TRANSITION REGION. I. HYDROSTATIC THERMAL MODELS WITH AMBIPOLAR DIFFUSION	*J. M. Fontenla, E. H. Avrett, and R. Loeser*	700	97-C4
RELATIONSHIP OF MAGNETIC FIELD STRENGTH AND BRIGHTNESS OF FINE-STRUCTURE ELEMENTS IN THE SOLAR TEMPERATURE MINIMUM REGION	*J. W. Cook and J. A. Ewing*	719	97-D11
SOLAR WIND SPEED AND CORONAL FLUX-TUBE EXPANSION	*Y.-M. Wang and N. R. Sheeley, Jr.*	726	97-E10
ON THE POSSIBILITY OF AN $\alpha^2\omega$-TYPE DYNAMO IN A THIN LAYER INSIDE THE SUN	*Arnab Rai Choudhuri*	733	97-F5
ERRATA			
On Lithium Removal from G Dwarfs	*L. M. Hobbs, Icko Iben, Jr., and Catherine Pilachowski*	745	97-G5
Vacuum Ultraviolet Images of the Large Magellanic Cloud	*Andrew M. Smith, Robert H. Cornett, and Robert S. Hill*	746	97-G6
INSTRUCTIONS TO AUTHORS		i	98-A5
INDEX TO VOLUME 355, PARTS 1 AND 2		*See Part 2*	